Commonwealth of Kentucky
Division for Air Quality
RESPONSE TO COMMENTS

ON THE TITLE V DRAFT PERMIT V-02-043 REVISION 3
Louisville Gas and Electric Company
P.O. Box 32010, Louisville, Kentucky, 40232
COMBUSTION SECTION, REVIEWER
January 11, 2008
SOURCE I.D. #: 021-223-00002
SOURCE A.I. #: 4054
ACTIVITY #: APE 20070001

CURRENT PERMITTING ACTION: Significant RevisionV-02-043 R3

Background

On January 4, 2006, Permit V-02-043 was revised to provide for construction and operation of a new 750 MW net nominal supercritical pulverized coal (SPC) boiler and associated support equipment ("Revision 2"). On February 13, 2007, the Division received an application for a significant revision to amend the permit for permitting design revisions to the SPC boiler project. This revision ("Revision 3") is being reviewed as a significant permit revision under 401 KAR 52:020 Section 16. A summary of Revision 3 changes to the project's potential-to-emit (PTE), regulatory applicability, and the model-predicted maximum impacts as a result of this revision are presented in the application that was submitted to Division on February 13, 2007.

PROJECT SUMMARY

As part of Revision 3, Emission Unit 31 will also be equipped with a dry electrostatic precipitator (DESP), powdered activated carbon (PAC) injection and hydrated lime injection. The DESP will ensure that saleable fly ash is captured prior to potential contamination due to PAC injection for mercury control. The hydrated lime injection will assist in proper conditioning of the Pulse Jet Fabric Filter (PJFF) bags by potentially reducing SO_3 emissions for some fuel combinations. However, it has not been proposed as an alternative SO_3 emission reduction technology.

The proposed modifications do not affect the new boiler, Emission Unit 31, BACT determinations, nor cause an increase in any NSR regulated air pollutant. An increase in the size and hours of operation of the auxiliary boiler (Emission Unit 32) will potentially result in an insignificant increase in carbon monoxide emissions. The potential emissions of sulfur dioxide and sulfuric acid mist decreased due to the switch to ultra low sulfur fuel oil in the auxiliary boiler. Ultra low sulfur (ULS) is defined as a fuel that contains less than 15 ppm of total sulfur. The potential emissions from the emergency generator (Emission Unit 33) also decreased as a result of the proposed change to ULS fuel along with the proposed reduction in the number of hours of operation on an annual basis. Additionally, with this revision the originally proposed emergency diesel fire water pump (insignificant activity) and the three existing auxiliary boilers (Emission Units 7, 8 and 9) are not required. The elimination of emissions from these sources will further decrease the overall Project's PTE.

Material handling emissions have the potential to minimally increase as a result of this revision due to several changes. Specifically, these changes consist of (1) the addition of material handling silos (waste ash, hydrated lime and PAC), (2) movement of the proposed conveyers transfer points with their currently established BACT controls, (3) new conveyor transfer points with the BACT controls,

and (4) new haul road emissions due to additional haul road length to extend the previous route to the northwest corner of the ash pond and the change in methodology used to calculate these emissions. Additionally, there was a significant decrease in particulate emissions associated with ash transfer design change from truck transport to a wet transfer of the fly ash to the pond.

With the change to ULS fuel, the heating value of the oil fired for the auxiliary boiler (Emission Unit 32), emergency generator (Emission Unit 33), and for startup operations of the Unit 2 boiler (Emission Unit 31), along with the increase in hours of operation for the auxiliary boiler, the amount of fuel oil utilized at the facility increased. The increase in oil consumption will cause an increase to the turnover rates of the fuel oil storage tanks, thus the VOC emissions from the fuel oil storage tank will insignificantly increase. Fuel oil storage tanks are an insignificant activity and are listed as such in the permit.

The emission calculations for the Linear Mechanical Draft Cooling Tower (LMDCT) (Emission Unit 41), were updated based on a more conservative assumption that 100 percent of the salt is PM_{10}. As a result, the calculated total PM emissions from the LMDCT increased. However, potential PM emissions from the natural draft cooling tower (Emission Unit 20) significantly decreased as a result of the proposed modifications to reduce existing drift rate from 0.008% to 0.0005%. This change to the natural draft cooling tower's drift eliminators will occur prior to Emission Unit 31 commencing operation.

The applicant used the same methodology presented in the 2004 Application to determine the emissions change from the Project revisions. These emissions were incorporated into the Project's potential-to-emit calculations used to determine the PSD/NSR major modification determination. The methodology to calculate these emissions can be found in Section 2 and Appendices C and D of the February 2007 Application. Table 3.1 depicts the PTE emissions that were presented in the 2004 Application document while Table 3.4 illustrates the PTE resulting from the proposed Project's optimizations. The net emissions resulting from the proposed revisions based on the refined design are presented in Table 3.5. As presented in Table 3.5, the emissions of the proposed changes are below their applicable significant emission increase threshold for a major modification under PSD. Likewise, as shown in Table 3.4, there are no changes to the project's applicability under the original PSD review process from what was determined for the 2004 Application and established as the basis for the subsequently issued permit in January 2006.

PUBLIC AND AFFECTED STATE REVIEW:

The affected states (Ohio and Indiana) were notified of the issuance of the draft permit on July 27, 2007 via e-mail. On September 26, 2007, the public notice on availability of the draft permit and supporting material for comments by persons affected by the plant was published in The Trimble Banner in Bedford, Kentucky and the Louisville Courier Journal in Louisville, Kentucky. The public comment period expired 30 days from the date of publication.

Comments on the Draft Title V Permit were submitted by Faith E. Bugel and Meleah Geertsema, staff attorneys of Environmental Law & Policy Center on behalf of Sierra Club, Valley Watch, Inc. and Save the Valley, Inc. on November 5, 2007. Attachment A to this document lists the comments received and the Division's response to each comment. No changes were made to the permit as a result of the comments received. Further, in no case were any emissions standards, or any monitoring, recordkeeping or reporting requirements relaxed. Please see Attachment A for a detailed discussion of the comments and the responses thereto. Therefore, the Division has made a final determination to issue a proposed permit. The U.S. EPA has 45 days from the date of the issuance of this permit to submit comments. If no comments are received during this period, the Division will issue a final permit.

ATTACHMENT A
Response to Comments

Comments on the Draft Title V Permit submitted by Faith E. Bugel and Meleah Geertsema, staff attorneys of Environmental Law & Policy Center on behalf of Sierra Club, Valley Watch, Inc. and Save the Valley, Inc.

We are writing to submit comments on the Revised Draft PSD/Title V Permit for the proposed Trimble County Generating Station, Permit No. 02-043, Revision 3, on behalf of Sierra Club, Valley Watch, Inc., and Save the Valley, Inc. The revised draft permit covers several revisions submitted by Louisville Gas and Electric ("LG&E") to its initial application to add a second unit at the Trimble County Station ("the Plant," "TC2"), reflecting design work since the original 2004 application. These revisions include an August 2006 minor revision pertaining to particulate matter emissions from material handling, as well as February 2006 significant revisions consisting of, among other things, the inclusion of a dry electrostatic precipitator (DESP) upstream of the pulsed jet fabric filter (PJFF), hydrated lime injection, changes to material handling, and changes to the auxiliary boiler and emergency generator. The permit documents also reaffirm decisions made in the Revision 2 process.

Commentors filed a petition with the Office of Administrative Hearings over Revision 2 of the Trimble County Permit, which resulted in a contested case hearing during 2005-2006. In the current submission, we raise only those comments arising from the Revision 3 changes, or for which new law or new circumstances have arisen since the Revision 2 proceedings. Commenters note their continuing concern with all of the issues not discussed in these comments but raised in the previous comments, petition, and appeal. To the extent necessary to preserve all rights on appeal, and given KDAQ's authority to revise a permit, 401 KAR 50:060 Section 4(2)[1], Commenters incorporate these issues here by reference to the briefing in the Revision 2 proceedings. See Attachment A.

For the reasons discussed below, the Kentucky Division of Air Quality ("KDAQ") must deny the permit or make substantial revisions to the current draft. If the agency again revises the draft permit, the revised draft must then be re-noticed and the public must have a full and fair opportunity to comment and request a hearing on the revised draft.

I. The Permit Fails to Address Harmful Carbon Dioxide from the Plant

Neither the present Revision 3 draft permit nor the previous Revision 2 permit addresses the carbon dioxide (CO2) or other greenhouse gases to be emitted from the proposed plant. Yet, TC2 will be a significant emitter of greenhouse gas pollutants. These emissions will contribute significantly to global warming and its adverse impacts on the health, welfare, economy and environment of the State of Kentucky. KDAQ must deny the permit under the Supreme Court's recent decision on the status of carbon dioxide as an air pollutant under the Clean Air Act in Massachusetts v. EPA, 549 U.S. ___, 127 S. Ct. 1438 (Apr. 2, 2007), because it fails to address the several million tons of carbon dioxide that the facility will emit.

a. Carbon dioxide emissions threaten Kentucky's public health and environment

1 "The cabinet may order appropriate modifications to any permit or compliance schedule whenever it appears that the conditions of the permit or compliance schedule will not be sufficient to meet all of the standards and requirements contained in these administrative regulations…"

The Intergovernmental Panel on Climate Change ("IPCC") has issued a series of assessment reports that add to a growing body of scientific evidence that the planet is warming and humans are largely responsible. The reports also concluded that there are profound and grave climatic, environmental, weather, and other effects as a result of global warming. The IPCC identifies the following impacts as either "likely" or "very likely" to occur as CO2 concentrations in the atmosphere increase:

- Higher maximum temperatures over most land areas;
- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures and fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- More intense precipitation events over many areas; and
- Increased summer dry conditions and associated risk of drought over most mid-altitude continents.[2]

The extent of negative global warming impacts will depend on the amount of CO2 emitted into the atmosphere. However, the fact of those negative impacts is certain. The National Academies of Science, in the report "Climate Change Science" (2001), found that the "risk [to human welfare and ecosystems] increases with increases in both the rate and the magnitude of climate change."[3] Simply put, the more CO2 humans release into the atmosphere, the more serious the impacts on the environment.

In 2001, the U.S. Global Change Research Program released Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change (National Assessment) predicting effects of climate change for each region in the U.S.[4] The report was authored by scientists from the U.S. Geological Survey, USDA Forest Service, and numerous universities across the nation. The National Assessment shows that "the changes in the simulated heat index for the Southeast [including Kentucky] are the most dramatic in the nation."[5] With the increased heat, air pollution is also likely to worsen.[6] "Without strict attention to regional emissions of air pollutants, the undesirable combination of extreme heat and unhealthy air quality is likely to result."[7] In other words, harmful air quality will accompany the heat increases predicted for Kentucky as a result of global warming.

According to the National Assessment, effects on Kentucky, as with the rest of the Southeast, are expected to be significant in terms of human health: "of concern…are the effects that elevated surface temperatures have on human health as a result of prolonged or persistent periods of excessive summertime heat events coupled with droughty conditions." National Assessment, p. 146.[8] Heat is not the only expected cause of health problems in Kentucky's region. Decreases in water quality are also expected, and "effects on surface waters of changes in precipitation have important health implications in the region. Increased precipitation promotes the transportation of bacteria as

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2 International Panel on Climate Change, Climate Change 2007: The Physical Science Basis, Summary for Policy Makers, hereinafter IPCC 2007 (attached and available at www.ipcc.ch)

3 Committee on the Science of Climate Change, National Research Council, "Climate Change Science: An Analysis of Some Key Questions," National Academies Press (2001)

4 National Assessment Synthesis Team (2000), available at http://globalchange.gov/pubs/nast_2000.html

5 National Assessment Overview, p. 48, available at http://globalchange.gov/pubs/nast_2000.html (select Overview, then Southeast Mega-Region)

6 IPCC, Third Assessment Report, "Climate Change 2001: Impacts, Adaptation, and Vulnerability," p. 764, available at http://www.grida.no/climate/ipcc_tar/

7 Op cit., p. 55.

8 Chapter 5, "Potential Consequences of Climate Variability and Change for the Southeastern United States."

well as other pathogens and contaminants by surface waters throughout the region."[9] Unless releases of global warming pollution are curbed and then significantly decreased, global warming pollution will pose significant threats to the health, welfare, and economy of Kentucky.

Echoing the findings of the IPCC, the U.S. Supreme Court in Massachusetts v. EPA found harms associated with climate change caused by CO2 to be "serious and well recognized." Massachusetts, 549 U.S. ___, 127 S. Ct. at 1455. These harms include a precipitous rise in sea levels, severe and irreversible changes to natural ecosystems, "a significant reduction in water storage in winter snowpack . . . with direct and important economic consequences," an increase in the spread of disease, and an increase in the ferocity of weather events. See Massachusetts, 549 U.S. ___, 127 S. Ct. at 1456. The U.S. EPA also has concluded that "[a] few degrees of warming increases the chances of more frequent and severe heat waves, which can cause more heat-related death and illness,"[10] as well as "more frequent droughts, … greater rainfall, and possibl[e] change[s in] the strength of storms."[11] These are only a few of the threats posed by global warming.

b. Carbon dioxide is an air pollutant under Kentucky and federal law.

Section 302(g) of the Clean Air Act defines "air pollutant" expansively to include "any physical, chemical, biological, radioactive . . . substance or matter which is emitted into or otherwise enters into the ambient air." 42 U.S.C. § 7602(g). In its opinion in Massachusetts v. EPA, the Supreme Court held that carbon dioxide and other greenhouse gases are air pollutants as defined in Section 302(g), 42 U.S.C. § 7602(g). 549 U.S. ___, 127 S. Ct. at 1459-60. The Court based its holding on the "unambiguous" language of the definition. Id. at 1460. The Court further held that because carbon dioxide is within the Clean Air Act's definition of "air pollutant," EPA has the authority to regulate carbon dioxide under the Act. Id. at 1462. The Massachusetts v. EPA decision dispensed with any uncertainty whether carbon dioxide is an "air pollutant" under the Clean Air Act.[12]

Kentucky law employs similarly broad definitions of "air contaminant," "air pollution," and "air pollutant." Under KRS 224.01-010, an "air contaminant" is defined as "smoke, dust, soot, grime, carbon, or any other particulate matter, radioactive matter, noxious acids, fumes, gases, odor, vapor, or any combination thereof." KRS 224.01-010(1). The same chapter defines "air pollution," in turn, as "the presence in the outdoor atmosphere of one (1) or more air contaminants in sufficient quantities and of such characteristics and duration as is or threatens to be injurious to human, plant, or animal life, or to property, or which unreasonably interferes with the comfortable enjoyment of life or property." KRS 224.01-010(3). Kentucky regulations define "air pollutant" as synonymous with "air contaminant" under KRS 224.01-010(1). 401 KAR 50:010 Section 1(1)(3). Thus, for the same reasons put forth by the Supreme Court, Kentucky laws and regulations governing air pollution apply to carbon dioxide and other greenhouse gas emissions.

c. Carbon dioxide is a regulated pollutant under the Clean Air Act and Kentucky law.

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9 National Assessment Overview, p. 159

10 U.S. EPA, climate change website, last updated on April 6, 2001, http://www.epa.gov/globalwarming/faq /fundamentals/html

11 U.S. EPA, climate change website, last updated on April 6, 2001, http://www.epa.gov/globalwarming/faq /moredetail/html

12 EPA's then general counsel, Jonathan Z. Cannon, opined in 1998 that carbon dioxide is within the Clean Air Act's definition of "air pollutant" and that EPA has the authority to regulate carbon dioxide. More recently, however, EPA has advanced a contrary interpretation that is contrary to the plain language of Section 302(g) and the Massachusetts v. EPA opinion.

Not only is carbon dioxide an air pollutant under federal and state law, but it is also subject to regulation under the Clean Air Act and Kentucky law. U.S. EPA both currently regulates and has the unexercised authority to regulate carbon dioxide under several Sections of the Act.

Carbon dioxide is subject to regulation under Section 821 of the Clean Air Act Amendments of 1990. Section 821(a) of the Act provides as follows:

> Monitoring. – The Administrator of the Environmental Protection Agency shall promulgate regulations within 18 months after the enactment of the Clean Air Act Amendments of 1990 to require that all affected sources subject to the Title V of the Clean Air Act shall also monitor carbon dioxide emissions according to the same timetable as in Sections 511(b) and (c). The regulations shall require that such data shall be reported to the Administrator. The provisions of Section 511(e) of Title V of the Clean Air Act shall apply for purposes of this section in the same manner and to the same extent as such provision applies to the monitoring and data referred to in Section 511.[13]

(42 U.S.C. 7651k note; Pub.L. 101-549; 104 Stat. 2699; emphasis added). The language could not be clearer: in Section 821, Congress ordered EPA "to promulgate regulations" requiring that hundreds of facilities covered by Title IV monitor and report their CO2 emissions.[14]

In 1993, EPA promulgated the regulations required by Section 821, which are set forth at 40 C.F.R. Part 75. The purpose of Part 75 is "to establish requirements for the monitoring, recordkeeping, and reporting of sulfur dioxide ("SO2"), nitrogen oxides ("NOx"), and carbon dioxide ("CO2") emissions." 40 C.F.R. § 75.1 (emphasis added).[15] Kentucky has incorporated Part 75 by reference into its own regulations. See, e.g., 401 KAR 52:060 Section 2(d). Rules on information gathering, record-keeping and data publication have long been recognized as falling within the conventional understanding of the word "regulation." See, e.g., Buckley v. Valeo, 424 U.S. 1, 66-67 (1979) (record-keeping and reporting requirements constitute regulation of political speech). These monitoring requirements clearly establish carbon dioxide as subject to regulation, and hence as a "regulated NSR pollutant." See I.d.iv below (40 C.F.R. § 52.21(b)(50) and 401 KAR 51:001 Section 1(211) define "regulated NSR pollutant" as including "any pollutant . . . subject to regulation under the Act.")

Carbon dioxide also is subject to regulation under Section 202, which requires standards applicable to emissions of "any air pollutant" from motor vehicles, and Section 111[16], which

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[13] According to the Reporter's notes, these references to Title V are meant to refer to Title IV, and the references to Section 511 are meant to refer to Section 412.

[14] EPA's §821 regulations, which were finalized on January 11, 1993, require CO2 emissions monitoring (40 CFR §§75.1(b), 75.10(a)(3)); preparing and maintaining monitoring plans (40 CFR §75.33); maintaining records (40 CFR §75.57); and reporting such information to EPA, (40 CFR §§75.60 – 64). 40 CFR §75.5 prohibits operation in violation of these requirements and provides that a violation of any Part 75 requirement is a violation of the Act.

[15] The Part 75 regulations generally require monitoring of carbon dioxide emissions through installation, certification, operation and maintenance of a continuous emission monitoring system or an alternative method (40 C.F.R. §§ 75.1(b), 75.10(a)(3)); preparation and maintenance of a monitoring plan (40 C.F.R. § 75.33); maintenance of certain records (40 C.F.R. § 75.57); and reporting of certain information to EPA, including electronic quarterly reports of carbon dioxide emissions data (40 C.F.R. §§ 75.60 – 64). 40 C.F.R. § 75.5 prohibits operation of an affected source in the absence of compliance with the substantive requirements of Part 75, and provides that a violation of any requirement of Part 75 is a violation of the Clean Air Act.

[16] A challenge to EPA's failure to establish emission limits for carbon dioxide emissions from power plants under Section 111 of the Clean Air Act is pending before the United States Court of Appeals for the District of Columbia Circuit. State of New York, et al. v. EPA, No. 06-1322. EPA refused to establish such emission limits solely on the ground that EPA lacked the authority to regulate carbon dioxide under the Clean Air Act. Based on Massachusetts v. EPA, petitioners, on May 2, 2007, asked the Court of Appeals to vacate EPA's determination that it lacks

requires standards of performance for emissions of "air pollutants" from new stationary sources. 42 U.S.C. §§ 7411, 7521. While EPA and the States have not yet established limits under Sections 202 and 111, they have the clear statutory authority to do so. Regulation under Sections 202 and 111 is required where air pollution "may reasonably be anticipated to endanger public health or welfare." 42 U.S.C. § 7411(b)(10(A0; 42 U.S.C. § 7521(a)(1). The Supreme Court's holding in Massachusetts v. EPA dispensed with any uncertainty whether EPA and the states have the authority to take action to control carbon dioxide emissions under Sections 202 and 111.

The Massachusetts v. EPA case specifically involved a challenge to EPA's failure to prescribe regulations on carbon dioxide emissions from motor vehicles under Section 202 of the Clean Air Act. The Court held that EPA has the authority to issue such regulations, and rejected the excuses advanced by EPA for failing to do so. Massachusetts, 549 U.S. ___, 127 S. Ct. at 1459-63. Therefore, carbon dioxide is undeniably "subject to regulation" under the Act. Id. at 1462. Following the Court's decision President Bush, in a May 14, 2007 Executive Order[17], acknowledged EPA's authority to regulate emissions of greenhouse gases, including carbon dioxide from motor vehicles, nonroad vehicles and nonroad engines under the Clean Air Act. The Executive Order directs EPA to coordinate with other federal agencies in undertaking such regulatory action.

For the above reasons, carbon dioxide is an air pollutant subject to regulation under the Clean Air Act and Kentucky law. This status has numerous implications for the proposed permit, all requiring KDAQ to deny the permit in its current form.

d. KDAQ must deny the permit due to LG&E's failure to address carbon dioxide emissions from the proposed unit. Best Available Control Technology ("BACT") limit for carbon dioxide.

i. The application lacks the required information regarding carbon dioxide from the facility and other related information.

Kentucky regulations require an application for a Title V permit to include "[a]ll the information needed to determine the applicable requirements and emission fees," 401 KAR 52:020 Section 5(1), as well as "all emissions of regulated air pollutants." Id. at Section 5(3) (emphasis added). Thus, as carbon dioxide is a regulated air pollutant as put forth above and a BACT analysis is required for carbon dioxide (see I.d.iv below), the application is incomplete because it omits the required information regarding carbon dioxide. KDAQ cannot issue the permit based on the incomplete application, and must remand the application to LG&E for the required carbon dioxide information.

ii. The application lacks a proper cumulative environmental assessment.

Kentucky law requires an applicant for construction of an electric generating facility to submit a cumulative environmental assessment to the cabinet with its application. KRS 224.10-280(1)(a). The cumulative environmental assessment must contain a description, along with analytical support, of the types and quantities of air pollutants that will be emitted from the facility, as well as the methods to be used to control those emissions. KRS 224.10-280(3)(a).[18] Nowhere in

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authority to regulate carbon dioxide emissions under Section 111, and to remand the matter to EPA for further proceedings consistent with the Massachusetts v. EPA decision. 5

[17] Available at http://www.whitehouse.gov/news/releases/2007/05/print/20070514-1.html

[18] It should be noted that the text of KRS 224.10-280 does not include the word "regulated" to modify "air pollutants," but applies broadly to all "air pollutants" as defined by Kentucky law to include "smoke, dust, soot,

the applications for either Revision 2 or Revision 3 does LG&E include a cumulative environmental assessment that describes emissions of carbon dioxide from the facility and methods to be used to control such emissions. For this reason, the Revision 3 application is incomplete and must be returned to the applicant for the required assessment. 401 KAR 51:017 Section 12(1)(c) (required source information includes a detailed description of the system of continuous emissions reduction planned for the source or modification and emissions estimates); 401 KAR 52:020 Section 5(1) and (3).

iii. KDAQ must fulfill its duty to protect the public health and environment by denying the permit.

The incompleteness of the application is not the only grounds for denying the permit. KDAQ must deny the permit based on the harm to public health and the environment that would occur due to uncontrolled carbon dioxide emissions from the proposed source.

As outlined above, the harms to public health and the environment from carbon dioxide and other greenhouse gases are clear. The Kentucky definitions of air contaminant, air pollution and air pollutant are as broad as the parallel federal definition. Kentucky law calls upon the Cabinet to "[p]rovide for the prevention, abatement, and control of all… air pollution" and grants the Cabinet the authority to deny a permit for the "installation, alternation, or use of any machine, equipment, device, or other article that may cause or contribute to air pollution…" KRS 224.10-100(5) and 19(b). Furthermore, Kentucky regulations provide that the cabinet may initiate a public hearing when "[t]he cabinet has reason to believe remedies should be sought or an order should be entered against any person to protect the environment or the health and safety of the public." 401 KAR 100:010 Section 12(1)(b). Such remedies include permit revocation, termination, denial, modification, or suspension. Id. at (2)(a). KDAQ thus has the authority and, in fact, the duty to prevent harm to health and the environment that, as here, would occur were a permit granted without provisions minimizing carbon dioxide from the facility. For these reasons, KDAQ should act responsibly by denying the Revision 3 permit and revoking the Revision 2 permit.

iv. KDAQ must deny the permit because it lacks a BACT limit for carbon dioxide.

A permit may not issue where it omits a required BACT limit. See 42 U.S.C. § 7475(a)(4). As the permit must include a carbon dioxide BACT limit pursuant to the recent Supreme Court decision in Massachusetts and Kentucky law, KDAQ cannot issue the proposed permit.

Section 165 of the federal Clean Air Act and Kentucky Air Quality Regulations prohibit the construction of a new major stationary source of air pollutants at the Trimble County site except in accordance with a prevention of significant deterioration construction permit issued by KDAQ. 42 U.S.C. § 7475(a); 401 KAR 51:017. Federal law requires a BACT analysis and BACT permit emission limitations "for each pollutant subject to regulation under [the Clean Air Act]" for which emissions exceed specified significance levels. 42 U.S.C. §§ 7475(a), 7479. The statutory definition of BACT also makes clear that BACT requirements apply to all air pollutants subject to regulation under the Clean Air Act, stating that "[b]est available control technology means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this Act…" 42 U.S.C. 7479(3)(emphasis added); see also

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grime, carbon, or any other particulate matter, radioactive matter, noxious acids, fumes, gases, odor, vapor, or any combination thereof." KRS 224.01-010(1); 401 KAR 50:010 Section 1(1)(3) ("air pollutant" has the same definition as "air contaminant" under KRS 224.01-010(1)).

40 C.F.R. § 52.21(b)(12), 401 KAR 51:001 Section 1(25).

In 401 KAR 51:017, KDAQ adopted, largely verbatim, the Environmental Protection Agency's ("EPA") Prevention of Significant Deterioration regulations set forth at 40 C.F.R. § 52.21. The EPA regulations provide that "[a] new major stationary source shall apply best available control technology for each regulated NSR pollutant that it would have the potential to emit in significant amounts." 40 C.F.R. § 52.21(j)(1)(emphasis added); see also 401 KAR 51:017 Section 8. They also define "regulated NSR pollutant" as including "any pollutant . . . subject to regulation under the Act." 40 C.F.R. § 52.21(b)(50)[19]; 401 KAR 51:001 Section 1(211) (emphasis added).

A pollutant is "subject to regulation" either where U.S. EPA has acted upon its legitimate authority to pass regulations or where U.S. EPA has the authority to enact regulations but has not yet done so. As put forth above, U.S. EPA both currently regulates carbon dioxide under the 1990 Clean Air Act Amendments and has additional, unexercised authority to regulate carbon dioxide, clearly establishing carbon dioxide as a pollutant subject to regulation under the Clean Air Act and hence a regulated NSR pollutant for BACT purposes. See I.b and c. Kentucky has either adopted regulations following the federal rules or incorporated the federal regulations by reference, and thus the same conclusions apply under state law.

EPA's current position, expressed in the In Re Deseret Power Electric Cooperative case before the Environmental Appeals Board, that Congress in Section 165 used the term "regulated" to mean subject to "a statutory or regulatory provision that requires actual control of emissions" is untenable.[20] First, this erroneous interpretation is at odds with the plain meaning of the statute. Webster's Dictionary defines "regulation" as "an authoritative rule dealing with details or procedure; (b) a rule or order issued by an executive authority or regulatory agency of a government and having the force of law." The definition does not limit regulation to limits on emissions. Second, the interpretation is inconsistent with the term's context. There is no rationale for explaining why "regulation" in Section 821 means "regulation", but that "regulation" in Section 165 means "actual control of emissions." Indeed, the Act contains numerous other examples of Congress requiring regulations for many reasons aside from "actual control of emissions."[21] Third, in drafting the Clean Air Act Congress knew how to refer to "actual control of emissions" when it wanted to, and in fact created two separate terms of art for just such occasions, "emissions limitation" and "emissions standard": "The terms 'emission limitation' and 'emission standard' mean a requirement established by the State or the Administrator which limits the quantity, rate or concentration of emissions of air

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[19] 19 "Regulated NSR pollutant, for purposes of this section, means the following:

(i) Any pollutant for which a national ambient air quality standard has been promulgated and any constituents or precursors for such pollutants identified by the Administrator (e.g., volatile organic compounds are precursors for ozone);

(ii) Any pollutant that is subject to any standard promulgated under Section 111 of the Act;

(iii) Any Class I or Class II substance subject to a standard promulgated under or established by title VI of the Act; or

(iv) Any pollutant that otherwise is subject to regulation under the Act; except that any or all hazardous air pollutants either listed in section 112 of the Act or added to the list pursuant to section 112(b)(2) of the Act, which have not been delisted pursuant to section 112(b)(3) of the Act, are not regulated NSR pollutants unless the listed hazardous air pollutant is also regulated as a constituent or precursor of a general pollutant listed under section 108 of the Act."

[20] See briefing in In Re Deseret Power Electric Cooperative, PSD Permit Number OU-0002-04.00, U.S. EPA Environmental Appeals Board.

[21] These examples include Section 165 itself: "The review provided for in subsection (a) of this section shall be preceded by an analysis in accordance with regulations of the Administrator, promulgated under this subsection, . . . of the ambient air quality at the proposed site . . " 42 U.S.C. § 7475(e)(1). See also 42 U.S.C. § 7619(a)("the Administrator shall promulgate regulations establishing an air quality monitoring system throughout the United States…")

pollutants . . .” 42 U.S.C. § 7602(k).[22] Thus if Congress wanted to limit the applicability of Section 165 to those pollutants that were subject to such a standard or limitation, it certainly knew how to do so. It did not in Section 165. Finally, EPA’s interpretation runs afoul of the holding in Alabama Power Co. v. Costle, 636 F.2d 323, 403 (D.C. Cir. 1979), which foreclosed such creative narrow readings of the term “each pollutant subject to regulation” under the Act.[23]

The BACT analysis review that KDAQ must conduct for each pollutant subject to regulation under the Clean Air Act must include a case-specific review of relevant energy, environmental and economic considerations that is informed by detailed information submitted by the applicant. See 42 U.S.C. § 7479(3); 40 C.F.R. § 52.21(b)(12), (n). Based on its BACT review, KDAQ must set emission limitations in its permit. See 42 U.S.C. § 7479(3) (BACT means “an emission limitation”); 40 C.F.R. § 52.21(b)(12)(same); 401 KAR 51:001 Section 1(25). It is undisputed that TC2 is subject to BACT requirements for a number of air pollutants for which emissions will exceed specified significance levels. Furthermore, the proposed permit is subject to BACT requirements for carbon dioxide because carbon dioxide is a “regulated NSR pollutant” and the proposed new facility clearly will result in carbon dioxide emissions in excess of any applicable BACT significance threshold.[24] See Attachment B.[25] The proposed permit for the TC2 project does not contain a BACT emission limitation for carbon dioxide. KDAQ has made no effort to identify or evaluate available “production processes or available methods, systems and techniques for control” of carbon dioxide. See 40 C.F.R. § 52.21. In sum, LG&E failed to submit a BACT analysis for carbon dioxide and KDAQ failed to conduct a BACT analysis for carbon dioxide.

KDAQ’s failure to make a BACT determination for carbon dioxide and establish an emission limitation for carbon dioxide means that KDAQ may not lawfully issue a permit for the TC2 project. If KDAQ does not deny the requested permit for the reasons set forth above in I.d.iii, KDAQ must request that LG&E provide it with all information necessary to conduct a BACT analysis for carbon dioxide, conduct the required BACT analysis, and issue a revised proposed permit containing the required carbon dioxide BACT emission limitation. Such analysis must necessarily include all operations planned at the site.

1. The CO2 BACT analysis must consider carbon capture and sequestration (CCS).

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[22] Congress then used the terms “emission limitation” and “emission standard” throughout the Act (see, e.g., 42 U.S.C. § 7651d(a)(1)(“Each utility unit subject to an annual sulfur dioxide tonnage emission limitation under this section . . .”); 42 U.S.C. § 7412(f)(5)(“The Administrator shall not be required to conduct any review under this subsection or promulgate emission limitations under this subsection . . .”); 42 U.S.C. § 7521(f)(2)(“This percentage reduction shall be determined by comparing any proposed high altitude emission standards to high altitude emissions . . .”); 42 U.S.C. § 7617(a)(7)(“any aircraft emission standard under section 7571 of this title.”)

[23] The only administrative task apparently reserved to the Agency . . . is to identify those . . . pollutants subject to regulation under the Act which are thereby comprehended by the statute. The language of the Act does not limit the applicability of PSD only to one or several of the pollutants regulated under the Act,. . .the plain language of section 165 . . .in a litany of repetition, provides without qualification that each of its major substantive provisions shall be effective after 7 August 1977 with regard to each pollutant subject to regulation under the Act, or with regard to any "applicable emission standard or standard of performance under" the Act. As if to make the point even more clear, the definition of BACT itself in section 169 applies to each such pollutant. **The statutory language leaves no room for limiting the phrase “each pollutant subject to regulation” . . .**

[24] Section 52.21(b)(23)(i), 40 C.F.R., does not set forth a significance level for carbon dioxide. Therefore, pursuant to 40 C.F.R. § 52.21(b)(23)(ii), any emissions of carbon dioxide are significant.

[25] AP 42, Fifth Edition. Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Table 1.1-20, “Default CO Emission Factors for U.S. Coals.”

Should KDAQ remand the applicant to LG&E for a full BACT analysis for CO2, LG&E must evaluate add-on technologies to capture and sequester the greenhouse gas emissions. The U.S. EPA recently took the position that CCS is an available technology that should be considered for the control of carbon dioxide emissions. On June 22, 2007, the U.S. EPA submitted comments on a Draft Environmental Impact Statement for Nevada's White Pine Energy Station Project, an approximately 1.590 MW proposed coal-fired generating facility. Attachment C. In its comments, the U.S. EPA directed the BLM to "discuss carbon capture and sequestration and other means of capturing and storing carbon dioxide as a component of the proposed alternatives." Id. at 14. Information on carbon capture and sequestration technologies to guide KDAQ's review is available on the U.S. Department of Energy website, as D.O.E. is the primary federal agency working on research and development of CO2 capture and sequestration technologies.[26]

Capture. The International Panel on Climate Change ("IPCC") issued a report in 2005 discussing the main options currently available to capture CO2 from fossil fuel-fired power plants, including pre-combustion capture used at supercritical PC facilities.[27] According to the IPCC, commercial CO2 capture systems installed on PC facilities can reduce CO2 emissions by 80-90% per kilowatt-hour.[28] CO2 capture systems are available today and have been applied to several small power plants.[29] KDAQ must require LG&E to evaluate the available CO2 capture systems and to evaluate such CO2 control systems at the proposed supercritical PC facility in a proper top-down BACT process focused on maximum reduction of CO2.

Sequestration. LG&E must also submit an evaluation of the potential for transporting and sequestering carbon, such as through injection to enhance recovery of oil and gas from sites nearby the Trimble County Station or the construction of a pipeline for injection to other appropriate sites.

2. The CO2 BACT analysis must set a stringent output-based standard.

Carbon dioxide emissions are directly related to the amount of coal burned. Because electric generating plants are planned and operated to provide a specific amount of electricity, the more coal burned to produce a megawatt of electricity, the more carbon dioxide emitted. Similarly, the less coal burned the lower the emissions of regulated pollutants. In the top-down BACT analysis for each regulated pollutant KDAQ must consider output based limits. In short, more efficient electrical generation must be considered in a BACT determination because it is a "production process[] and available method[], system[] and technique[]… for control of each pollutant." 42 U.S.C. § 7479(3).

As part of the new NSPS standards, U.S. EPA adopted output-based standards as a step towards minimizing inefficient and unnecessarily polluting boilers. In the analysis for the new NSPS standards, U.S. EPA identified that boiler efficiency can vary enormously. See Memo from Christian Fellner U.S. EPA to Utility, Industrial and Commercial NSPS File, Gross Efficiency of New Units (February 2005). The following table from that same memo and identified as Table 2 describes the range of efficiencies:

(Table omitted)

U.S. EPA further explained that the highest efficiency subbituminous, bituminous, and lignite

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[26] See http://www.fossil.energy.gov/programs/sequestration/capture/.

[27] 2005 IPCC Special Report on Carbon dioxide Capture and Storage, Technical Summary, at 25. See also Chapter 3 of this report, available at http://arch.rivm.nl/env/int/ipcc/pages_media/SRCCS-final/IPCCSpecialReportonCarbon dioxideCaptureandStorage.htm).

[28] Id. at 107 (Chapter 3).

[29] Id. 10

facilities are 43, 38, 37 percent respectively. In a paper presented by three U.S. EPA combustion experts at the 2005 Pittsburgh Coal Conference they detailed the enormous difference in the efficiency (i.e., the CO2 emissions per ton of coal burned) between sub-critical, super-critical, ultra-supercritical and IGCC coal plants.[30] Following is Table 2 from that paper:

(Table omitted)

To minimize the emissions of carbon dioxide, KDAQ should insert a permit provision requiring the project proponent to maintain a net thermal efficiency at or above the appropriate level from the above Thermal Performance Comparisons table, or set an emission rate limit in pounds per MWh that is based on that efficiency. Such a term would minimize both the emissions of regulated pollutants and the collateral emissions of carbon dioxide.

3. If Harmful Levels of CO2 Remain Following the BACT Analysis, KDAQ Must Deny the Permit.

In the event that LG&E submits a BACT analysis and limit that would still result in harmful levels of carbon dioxide being emitted from the plant, KDAQ should deny the permit as set forth above in I.d.iii. The agency is not required to issue a permit simply because it contains a properly-supported BACT limit, as the agency retains broad authority to deny an air permit to protect the public health and environment from air pollution. See KRS 224.10-100(5) and (19)(b).

1. Division's response: *The Division does not concur. At this time, neither U. S. EPA nor Kentucky have adopted regulations addressing greenhouse gases, specifically carbon dioxide (CO_2). Although the Supreme Court decision cited by the commenter, Massachusetts v. EPA, 127 S. Ct. 1438 (2007), found that CO_2 is an air pollutant under the Clean Air Act ("CAA") and that U. S. EPA could regulate CO_2 , the decision did not hold that U. S. EPA was required to do so. Kentucky is required by statute to implement a PSD program that is no more stringent than federal requirements. KRS 224.10-100 (26). As there are no federal regulations establishing requirements for CO_2 at stationary sources, Kentucky is prohibited from imposing any such requirements.*

No BACT analysis is required for CO_2 as a result of the Revision 3 permitting action. The BACT definition found at 401 KAR 51:001 Section 1(25) is clear that BACT is required for "each regulated NSR pollutant that will be emitted from a proposed major stationary source or major modification… ." Major stationary sources and major modifications are also clearly defined according to emissions of regulated NSR pollutants for which a NAAQS has been promulgated, pollutants subject to a NSPS under Section 111 of the CAA, Class I and II substances subject to a standard under Section 602 of the CAA, and pollutants otherwise subject to a standard under Section 602 of the CAA 401 KAR 51:001 clearly defines " Regulated NSR Pollutant" as a pollutant for which a NAAQS has been promulgated, pollutants subject to a NSPS under Section 111 of the CAA, Class I and II substances subject to a standard under Section 602 of the CAA, and pollutants otherwise subject to regulation under the CAA. 401 KAR 51:001 Section 1(210). No NAAQS or NSPS has been established for carbon dioxide (CO_2), CO_2 is not a Class I or II substance nor is it otherwise regulated under any provision of the CAA at this time. Therefore, no BACT analysis is required for CO_2 in Revision 3.

Further, there is no indication that this permitting action will result in "harmful levels of carbon

[30] See Sikander Khan et al, Environmental Impact Comparisons IGCC vs. PC Plants (Sept. 2005)

dioxide." Carbon dioxide in and of itself is not considered a "potentially hazardous matter or toxics substances" under 401 KAR 63:020.

II. Netting for NOx and SO2

The Revision 2 permit did not undergo full Prevention of Significant Deterioration ("PSD") review for NOx and SO2, as KDAQ found that the proposed unit netted out of PSD for these pollutants. Changes in the Revision 3 permit are relevant to the NOx netting and thus must be fully supported to justify the continuing exemption from full PDS review.

a. Auxiliary Boiler Changes

The emissions margin supporting KDAQ's determination that Revision 2 "netted out" of PSD for NOx was two tons per year (netted emissions of 38 tpy versus the PSD significance level of 40 tpy). See Revision 2 SOB at 6. Given this small margin, it is critical that any subsequent changes in predicted NOx emissions be clearly supported. Here, calculations associated with changes in NOx emissions are lacking, calling into question the continued exemption of the project from PSD for NOx.

LG&E proposes to more than double the size of the new auxiliary boiler (from 40 mmBtu/hr to 100 mmBtu/hr) and double the operating hours (from 1,000 to 2,000 per year). Allegedly, the shutdown of the three existing auxiliary boilers will in large part offset the increased emissions from the changes to the new auxiliary boiler. However, the application does not provide complete, detailed emissions calculations evidencing this trade-off. See App. Appendix C, Performance Information (including a table listing only predicted emissions figures). The application is incomplete without this information, 401 KAR 52:020 Section 5(3) (application must include emissions information and calculations supporting the emissions information), and the permit therefore cannot issue.

2. Division's response: *The Division does not concur. LG&E provided the necessary information in its application dated February 13, 2007, Appendix C, Performance Information and Appendix D, Emissions Data. Appendix C and D taken together show that NOx emissions will be reduced as a result of this revision. The commenter apparently failed to take into consideration information contained in Appendix D.*

b. Emergency Diesel Generator

Revision 3 proposes a reduction in the number of hours of annual operation for the emergency diesel generator. SOB at p. 2. Ostensibly, the decrease in NOx emissions associated with the reduced hours contributes to off-setting the increase in NOx emissions from doubling of the allowed auxiliary boiler operation hours. The permit materials, however, again fail to provide clear support for the continued "netting out" of PSD for NOx. The materials do not include supporting calculations for NOx from the emergency diesel generator. Whether the diesel generator qualifies for RICE MACT for hazardous air pollutants is immaterial to the equipment's meeting PSD requirements. The permit materials must clearly document the NOx emissions from the diesel generator and show how these emissions figure into the netting calculations.

3. Division's response: *The Division does not concur. LG&E provided the necessary information in its application dated February 13, 2007, Appendix C, Performance Information and Appendix D,*

Emissions Data. Appendix C and D taken together show that NO_x emissions will be reduced as a result of this revision. The commenter apparently failed to take into consideration information contained in Appendix D.

c. Failure to account for margin of error.

The permit materials do not provide any accounting for the margin of error in the netting calculations. This omission renders the netting calculations unsupported. Applicants must account for the margin of error in their potential-to-emit calculations.

4. Division's response: *The Division does not concur. Because NO_x emissions will be reduced, netting is not affected. Therefore, no further review of the netting analysis is necessary. Further, DAQ notes that there are no established procedures supported by U.S. EPA that provides direction to adjust a netting analysis to account for what the commenter refers to as a "margin of error."*

III. The Draft Permit Does Not Contain Proper BACT Limits for Other Pollutants.

In addition to the omission of proper a BACT limit for carbon dioxide and the unsupported exemption from PSD for NOx and SO2, the permit includes erroneous BACT limits for other pollutants.

a. BACT at TC2 Consists of a Combination of Controls for Particulate Matter and Sulfuric Acid Mist.

The BACT analysis for particulate matter ("PM/PM10") and sulfuric acid mist ("SAM") must be done again in order to account for the addition of control options in Revision 3. The addition of control options to TC2 in Revision 3 invalidates the Revision 2 BACT limits, and requires the applicant and KDAQ to reassess BACT by conducting full, top-down BACT analyses for PM/PM10 and SAM accounting for emission reductions from the combined control options. Under the Clean Air Act and Kentucky air quality regulations, BACT is defined as:

> an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant.

42 U.S.C. § 7479(3); 401 KAR 51:001 Sec. 1(25). In sum, BACT breaks down into assessing the technical and economic feasibility of achieving the maximum degree of reduction in a pollutant. The statutory and regulatory definitions of BACT do not limit BACT to a single control technique, but require a comprehensive assessment of available methods, systems and techniques in light of, among other things, economic cost. See id.; see also NSR Manual, Section IV.A.[31] That an applicant proposes to use multiple control options presumptively establishes that the options are technically and economically feasible. Thus, to reflect the "maximum degree of reduction" especially where, as here, the applicant itself proposes use of multiple control options, a proper BACT emission limit

[31] "The objective in step 1 is to identify all control options with potential application to the source and pollutant under evaluation. Later, one or more of these options may be eliminated from consideration because they are determined to be technically infeasible or to have unacceptable energy, environmental or economic impacts."

must reflect the greatest level of reduction achievable by the combined options.

5**. Division's response**: *The Division does not concur. Revision 3 has resulted in insignificant changes to the project's original potential-to-emit as specified in Statement of Basis Table 3.4. Additionally, the PSD applicability on a pollutant-by-pollutant basis and the associated BACT determination for new equipment remain unchanged. Existing equipment will continue to operate within their permitted emission limits. The applicant has demonstrated that the insignificant change in emissions and associated impacts due to the design revisions will not result in any significant issues with respect to Kentucky air quality regulations.*

i. BACT for PM/PM10 from the Boiler should be based on use of DESP and PJFF.

The draft permit contains an operating limit of "PJFF" (pulse jet fabric filter) as BACT for PM/PM_{10} on Unit 31, the new pulverized coal boiler. Draft Permit p. 28, Con. 1. In addition, the emission limitations associated with this operating limit are (a) for filterable and condensable PM/PM10, 0.018 lb/mmBtu based on the average of three one-hour tests, and (b) for filterable PM, 0.015 lb/mmBtu based on a three-hour rolling average. Draft Permit p. 29, Con. 2(a) and (b). These limits are not BACT for PM/PM10 from the TC2 boiler.

The applicant is proposing to install "voluntarily" a dry electrostatic precipitator (DESP) upstream of the fabric filter "to collect saleable fly ash rather than achieving PM emission control." SOB at p. 23. According to KDAQ, "[a]ny PM emissions control [from the addition of the DESP] will be an insignificant coincidental benefit." Id.; see also Permit App. at 2-10 (addition of the DESP will not affect the filterable particulate or filterable/condensable limits from Revision 2). The permit thus reapplies the same BACT limits for filterable and filterable/condensable particulate matter as the Revision 2 permit, which was not based on use of a DESP. These limits are in unsupported for two reasons.

First, the applicant's and KDAQ's position appears to be that particulate matter BACT limits on the boiler may be set properly on the basis of the fabric filter's performance alone. This assumption is incorrect as a matter of law. As stated above, BACT under federal and Kentucky law is an emission limitation based on the maximum degree of reduction achievable through various control options, taking into account technical and economic feasibility. A DESP is used in part for control of particulate matter. See, e.g., App. at 2-10 (DESP to remove fly ash). The fact that LG&E itself has proposed to install the DESP means that the DESP in conjunction with a fabric filter is a technically and economically feasible control strategy for particulate matter from the boiler. The company's intent in installing a control technology is not cognizable under the definition of BACT, and cannot be used to excuse a failure to base BACT on all technically and economically feasible control options.

Second, contrary to KDAQ's and LG&E's factual assertions, use of a DESP in conjunction with a fabric filter is likely to result in appreciably lower particulate matter emissions than a fabric filter alone. The PM control efficiency for a DESP is approximately 99 percent, while a fabric filter controls PM emissions at a level of about 99.9 percent. Combining these two control efficiencies when the two pieces of equipment are operating in sequence would produce a control efficiency of 99.99 percent – a factor of ten lower than the proposed PM limits, which is hardly insignificant. Experience in the field with a similar configuration consisting of two ESPs in sequence to control particulate matter shows very low opacity, typically in the three percent range.[32] Neither LG&E nor KDAQ provide clear evidence that the level of control using a DESP and a fabric filter will not be

[32] See N. Sarunac, et al., "Field Experience with Mercury Monitors," Power, August 2007, p. 54 (article available at http://www.powermag.com/powerweb/archive_article.asp?a=52-SR_MM&y=2007&m=august)

greater than a fabric filter alone, but instead provide conclusory statements. The applicant and agency must support their assertions with full, transparent engineering calculations. In the absence of such calculations, the PM BACT limits are unsupported. The application must clearly demonstrate that a DESP in combination with a fabric filter will not likewise result in very low particulate matter emissions justifying a lower BACT limit.

6. Division's response: *The Division does not concur. Revision 3 does not involve any modification of Emission Unit 31. Therefore, Emission Unit 31 BACT limit for PM is not under review in this permitting action. The project revisions have resulted in insignificant changes to the project's original potential-to-emit as specified in Statement of Basis Table 3.4. Additionally, the PSD applicability on a pollutant-by-pollutant basis and the associated BACT determination for new equipment remain unchanged.*

ii. BACT for SAM from the Boiler should be based on use of WESP in combination with hydrated lime injection.

The same comment applies to BACT for SAM. LG&E is proposing to use hydrated lime injection to properly condition the PJFF by "potentially" reducing SO3. SOB at p. 2. According to KDAQ, hydrated lime "has not been proposed for as [sic] an alternative SO3 emission reduction technology." Id. Whether or not the applicant is proposing hydrated lime as a SO3 emission reduction technology is immaterial to whether reductions in SO3 from use of hydrated lime should be included in the BACT determination for SAM. Regardless, the application states that hydrated lime injection may be necessary "to help… control SO3 emissions." App. at p. 2-9. A purpose of hydrated lime is to remove SO3. See Appl. at 2-9 (lime injection system used to control SO3). The Wet Electrostatic Precipitator ("WESP") removal efficiency will be approximately 90 percent, while the sorbent will achieve 50-59 percent removal. Again, we were unable to find engineering calculations evidencing that emissions from use of hydrated lime and a WESP will be equivalent to emissions from use of a WESP alone. If hydrated lime is used in conjunction with the wet electrostatic precipitator (WESP, the proposed SAM control technology in the Revision 2 application and permit), reductions in SAM from the combined control options must be the basis for BACT. BACT must be based on the combined performance of a WESP and hydrated lime.

7. Division's response: *The Division does not concur. Revision 3 does not involve any modification of Emission Unit 31. The BACT limit for SAM is not under review in this permitting action. The project revisions have resulted in insignificant changes to the project's original potential-to-emit as specified in Statement of Basis Table 3.4. Additionally, the PSD applicability on a pollutant-by-pollutant basis and the associated BACT determination for new equipment remain unchanged.*

b. The Draft Permit lacks a BACT analysis for the Auxiliary Boiler.

i. Auxiliary boiler size

The Revision 3 SOB notes that "[s]ince the prior BACT determination on the auxiliary boiler was not contingent on the size of the proposed unit and was not affected by the size increase, the prior BACT determination for the auxiliary boiler is still applicable." SOB at 23. This statement is technically, and thus legally, incorrect. The size of the auxiliary boiler is related to the relative cost of control: the cost effectiveness of control increases as size of the boiler increases. Thus, retaining

the same BACT limit for a larger unit is inappropriate, as the larger unit should be able to achieve a lower limit at the same cost of control.

8. Division's response: *The Division does not concur. The prior BACT determination was based on a top down BACT analyses for carbon monoxide (CO). The proposed design and operation of the boiler continues to constitute BACT.*

ii. Top-down BACT for CO

The TC2 project is subject to BACT for carbon monoxide (CO). In turn, Revision 3 will result in a net emissions increase in carbon monoxide of 9.4 tons per year over Revision 2, SOB at 5, attributable to an increase in the auxiliary boiler's size and a doubling of annual hours of operation. SOB at 2. The Statement of Basis for Revision 2 included the following statement regarding the auxiliary boiler:

The auxiliary steam boiler will be a 40 mmBtu/hr, unit. The boiler will minimize emissions by utilizing low NOx burners and firing ASTM Grade No. 2-D S15 or equivalent fuel oil. The Division considers the proposed design and operation of the boiler and hours of operation for the boiler capped at 1,000 hours per year or less constitute BACT.

Rev. 2 SOB at 23. LG&E's proposed changes to the auxiliary boiler and resulting increases in emissions require a re-analysis of CO BACT for Unit 32.

Contrary to the applicant's and KDAQ's assertion, the "proposed design and operation of the [auxiliary steam] boiler" do not constitute BACT. See SOB at 13. Rather, a proper top-down BACT analysis for CO from the auxiliary boiler must consider and either select or properly reject add-on controls, such as an oxidation catalyst. Several existing auxiliary boilers use an oxidation catalyst and thus an oxidation catalyst must be considered as BACT for the TC2 auxiliary boiler. In addition, narrative BACT limits only are appropriate where the Cabinet determines that "technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible." 401 KAR 51:001 Sec. 1(25)(c); 40 C.F.R. 51.166(b)(12). Otherwise, BACT must include a numeric emissions limit. Since the auxiliary boilers using an oxidation catalyst have numeric BACT limits, the TC2 narrative permit limit of "proposed design and operation" is inappropriate.

The existing auxiliary boilers using an oxidation catalyst are located at the Crockett Cogeneration Facility in California. These three 40,000 lb/hr Foster-Wheeler auxiliary boilers were permitted at 11 ppm CO @ 3% O2 in 1996, achieved using an oxidation catalyst. See, e.g., Attachment D, Major Facility Review Permit issued to Crockett Cogeneration, at 7-8 (including emission limit of 3.0 lbs/hr based on a 3-hour average or 11.0 ppmv at 3% O2 dry basis based on a 3-hour average). The June 1997 source test measured 3.24 ppm @ 3% O2 from Boiler B and the June 1998 source test measured 6.02 ppm @ 3% O2 from Boiler C. These boilers are clear indicators that the BACT analysis and limit for the TC2 auxiliary boiler are in error.

9. Division's response: *The Division does not concur. The prior BACT determination was based on a top down BACT analyses for carbon monoxide (CO). The proposed design and operation of the boiler continues to constitute BACT.*

IV. Air Quality Modeling

The permit cannot issue because LG&E did not show sufficiently that the permit will not cause or contribute to air pollution in violation of an applicable National Ambient Air Quality

Standards ("NAAQS") or PSD increment in any area. Under Kentucky regulations, the applicant has the burden to demonstrate protection of air quality:

> The owner or operator of the proposed source or modification shall demonstrate that allowable emissions increases from the proposed source or modification, in conjunction with all other applicable emissions increases or reductions, including secondary emissions, shall not cause or contribute to air pollution in violation of:
>
> 1. A national ambient air quality standard in an air quality control region;
> or
> 2. An applicable maximum allowable increase over the baseline concentration in an area ["PSD increment"].

401 KAR 51:017 Sec. 9. Applicants perform modeling analyses in order to demonstrate that a source will not adversely impact NAAQS or a PSD increment. See 401 KAR 51:017 Secs. 10 and 11. In general, modeling should identify "worst-case impacts" to ensure protection of NAAQS and PSD increments. 401 KAR 51:017 Sec. 9; Rev. 2 Permit Appl., App. J at 3-5. For modeling to meaningfully ensure no adverse impacts, permitted emission levels must be modeled. 401 KAR 51:017 Sec. 9. Conversely stated, sources must operate within their modeled limits. The burden is not on commenters to demonstrate that "the proposed source will violate NAAQS" but only that "the applicant for the permit has not demonstrated with certitude the new source's compliance with NAAQS." Sierra Club v. Environmental and Public Protection Cabinet, slip op. at 9 (Franklin Cir. Ct. Aug. 6 2007) ("Thoroughbred")).

As will be discussed in greater detail below, the applicant failed in numerous ways to ensure compliance with NAAQS.

a. Omission of an analysis for PM2.5 impacts conflicts with federal and state law.

The permit and supporting documents fail to address particulate matter less than 2.5 micrometers, or PM2.5. Under Kentucky PSD regulations, the applicant must provide a technology analysis and air quality impact analysis for all NSR pollutants which the facility will result in a significant net emissions increase. Neither the agency nor the applicant contend that the TC2 project will result in insignificant emissions of PM2.5. Rather, both rely on PM10 as a surrogate for PM2.5 based on U.S. EPA guidance from 1997. SOB at p. 27. This reliance is in violation of Kentucky law. LG&E and KDAQ have duties to ensure protection of the PM2.5 NAAQS.

In 1997, EPA issued an annual standard for PM2.5 of 15 ug/m3, based on the 3-year average of annual mean PM2.5 concentrations, and a 24-hour standard of 65 ug/m3, based on the 3-year average of the 98th percentile of 24-hour concentrations. EPA recently (in September 2006, following issuance of the Revision 2 permit) tightened the 24-hour standard down to 35 ug/m3 and retained the annual standard of 15 ug/m3. EPA articulated the dangers of PM2.5 in its recent Fine Particle Implementation Rule, stating:

> The EPA established air quality standards for PM2.5 based on evidence from numerous health studies demonstrating that serious health effects are associated with exposures toelevated levels of PM2.5. Epidemiological studies have shown statistically significant correlations between elevated PM2.5 levels and premature mortality. Other important effects associated with PM2.5 exposure include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days), changes in lung function and increased

> respiratory symptoms, as well as new evidence for more subtle indicators of cardiovascular health. Individuals particularly sensitive to PM2.5 exposure include older adults, people with heart and lung disease, and children.

Clean Air Fine Particle Implementation Rule, 72 Fed. Reg. 20586, 20586-20587 (Apr. 25, 2007) (to be codified at 40 C.F.R. Part 51). By not requiring LG&E to provide adequate modeling for PM2.5, KDAQ has failed to carry out its duty to protect public health and the environment by ensuring that ambient air quality standards will not be violated for PM2.5 by the TC2 facility. See 42 U.S.C. § 7401(b)(1).

KDAQ excused LG&E from modeling PM2.5 and permitted modeling of PM10 instead, Revision 3 SOB at 27, ostensibly following an EPA memorandum approving the surrogate approach. See Memorandum from John S. Seitz, Director, EPA Office of Air Quality Planning & Standards, Interim Implementation of New Source Review Requirements for PM2.5 (Oct. 23, 1997). However, EPA memoranda do not supersede the authority of the Clean Air Act's implementing regulations. Regardless of what EPA may have stated in a memorandum, EPA does not have the power to effectively repeal a federal statutory requirement that States ensure that emissions from a given facility will not result in the violation of national ambient air quality standards for any pollutant. As EPA promulgated a NAAQS for PM2.5, PM2.5 is a pollutant for which modeling must be done to ensure that the NAAQS will not be violated. 40 C.F.R. § 52.21 (k)(1). The EPA cannot, with guidance, effectively repeal a regulation. "'Deference is not abdication, and it requires us to accept only those agency interpretations that are reasonable in light of the principles of construction courts normally employ.'" Pettibone Corp. v. United States, 34 F.3d 536, 541 (7th Cir. 1994) (quoting EEOC v. Arabian American Oil Co., 499 U.S. 244, 260, 111 S. Ct. 1227 (1991)) (Scalia, J. concurring in part and in the judgment).

The adequacy of the "surrogate approach" for analyzing PM2.5 impacts from a facility has been addressed by the Environmental Appeals Board (EAB) in In re: Prairie State Generating Company, PSD Appeal No. 05-05. In the Prairie State case, the EAB ruled that the approach used by the Illinois Environmental Protection Agency ("IEPA") to analyze PM2.5 impacts was in accord with controlling law. However, in that case, IEPA "conservatively assum[ed] that all the particulate matter emitted from the boilers is PM2.5." Prairie State, PSD Appeal No. 05-05, at 128. Thus, instead of ignoring PM2.5 impacts all together as LG&E did by looking only at protection of the PM10 NAAQS, the approach employed by IEPA accounted for PM2.5 impacts by assuming that all particulate matter coming from the facility was PM2.5, and based on that analysis found that Prairie State would not violate national ambient air quality standards for PM2.5. KDAQ at minimum should have adopted the approach used in Prairie State, which has been explicitly approved by the EAB.[33]

LG&E also cannot rely on arguments that PM2.5 modeling is not possible. Any such assertions regarding technical limitations relative to PM2.5 modeling are outdated, as technical capabilities for modeling PM2.5 do exist. See 70 Fed. Reg. 68218, 68234-68235, 40 C.F.R. § 51, App W, 5.1 (e), (f), (h), 5.2.2.1. EPA has identified available models to analyze the impacts of PM2.5 in its Guideline to Air Quality Models. See Appendix W of 40 C.F.R. § 51, proscribing modeling requirements for small particles (PM2.5); see also 40 C.F.R. § 52.21(l); 61 Fed. Reg.

[33] Petitioners also note that use of PM10 as a surrogate for PM2.5 may be viewed as using a model other than the preferred model and thus must meet the procedural requirements associated with use of an alternative model, including approval of the Regional Administrator and public notice and comment. See 40 C.F.R. § 52.21(l)(2). As far as Petitioners are aware, KDAQ did not receive Regional Administrator approval for or notice the decision to use PM10 as a surrogate for 2.5. 19

41838, 41850, 40 C.F.R. § 51, App W, 7.2.2(c) (August 1996) (showing that historically, "ISC [was] recommended for point sources of small particles . . . "); see also 70 Fed. Reg. 68218, 68234, 40 C.F.R. § 51, App W, 5.1 (e),(f),(h) (December 2005). Appendix W "addresses the regulatory application of air quality models for assessing criteria pollutants under the Clean Air Act." 70 Fed. Reg. 68218, Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions, Appendix W of 40 C.F.R. § 51 ("The Modeling Guideline"), Summary. The Guideline provides for modeling of PM2.5 using both the ISC and AERMOD models.

10. Division's response: *The Division does not concur. Previously established BACT limits are not under review in this permitting action. While the Division acknowledges that $PM_{2.5}$ is a regulated NSR pollutant, at this time EPA has not yet implemented NSR regulations for $PM_{2.5}$ NAAQS. It is well established that EPA has proposed the interim use of PM_{IO} as a surrogate for $PM_{2.5}$ until NSR rules have been implemented. EPA has represented that:*

> *In view of the significant technical difficulties that now exist with respect to $PM_{2.5}$ monitoring, emissions, estimation, and modeling, EPA believes that PM_{IO} may properly be used as a surrogate for $PM_{2.5}$ in meeting NSR requirements until these difficulties are resolved. When the technical difficulties are resolved, EPA will amend the PSD regulations under 40 C.F.R. §51.166 and 52.21 to establish a $PM_{2.5}$ significant emissions rate and EPA will also promulgate other appropriate regulatory measures pertinent to $PM_{2.5}$, and its precursors.*

Memorandum from John Seitz, Office of Air Quality Planning and Standards, "Interim Implementation of New Source Review Requirements for PM2.5" (October 21,1997).

U.S EPA recently reaffirmed its position:

> *Using the surrogate $PM_{2.5}$ nonattainment major NSR program, States should assume that a major -stationary source's PM_{10}, emissions represent $PM_{2.5}$ emissions and regulate these emissions using either Appendix S or the States' SIP-approved nonattainment major NSR program.*

Memorandum from Stephen Page, Office of Air Quality and Planning and Standards (April 5, 2005).

U.S. EPA has further proposed a $PM_{2.5}$ implementation rule in the September 21, 2007 Federal Register that continues to provide the use of PM_{10} as a surrogate for $PM_{2.5}$.

The applicant performed additional modeling for the optimization project and the results showed that the maximum modeled impacts are below all respective NAAQS and PSD increment PM_{10} thresholds, respectively. As PM_{10} is a surrogate for $PM_{2.5}$, the applicant adequately considered the effects of $PM_{2.5}$. DAQ considers compliance with PM_{10} as compliance with $PM_{2.5}$.

b. Retention of ISCST modeling

AERMOD is the current model recommended by U.S. EPA for modeling air quality. See

Appendix W to 40 CFR Part 51. The SOB notes that "[i]t has been determined that the addition of the proposed DESP, PAC, and lime injection does not change the Emission Unit 31's exhaust gas temperature, exit velocity, or proposed emissions and therefore the previous ISCST analysis [submitted in support of the January 2006 permit] is valid." Commentors object to this continued reliance on ISCST modeling. Revision 3 changes numerous emission sources closer to the ground than the Unit 31 stack. These changes necessitate comprehensive remodeling using the current AERMOD model.

11. Division's response: *The Division does not concur. Contrary to the assertion of the commenter, the SOB is clear that AERMOD modeling was performed and confirmed that prior ISCST modeling was valid.*

V. New Law Highlights Continuing Deficiencies in the Permit.

Several legal developments since Revision 2 clarify KDAQ's duties and highlight shortcomings of the permit, including the Franklin Circuit Court's Thoroughbred decision. Unless and until the state court decision is overturned, is it the controlling law as set forth below.

a. Limits must be expressed in units of mass per time and mass per heat input.

As set forth above, the Thoroughbred decision places the burden on the applicant to ensure protection of ambient air quality. In part to this end, the permit must establish enforceable emission rates in both units of mass per unit time and mass per MMBtu (or a control efficiency) in order to demonstrate continuous compliance over all operating conditions, and to ensure protection of short-term ambient air quality standards. See EPA Region 9 Title V Permit Review Guidelines at p. III-57 ("The title V permit must clearly include each limit and associated information from the underlying applicable requirement that defines the limit, such as averaging time and the associate reference method"); see also NSR Manual at B.56. The following permit limits are expressed only in pounds per million Btus: particulate matter, SO2, and NOx from Unit 1; particulate matter and SO2 from Unit 2; particulate matter, carbon monoxide and Volatile Organic Compounds ("VOCs") from Unit 31; and particulate matter and hydrogen chloride from Unit 32. The only way to convert these figures to mass per unit time is to use the unit's maximum heat input rate. However, the permit's maximum heat input rate (Btus per hour) is not directly enforceable because it is contained in the unit description. Descriptive information is not enforceable. More specifically, the permit contains no direct requirement to monitor heat input. Consequently, if the firing rate is not enforceable, then emission limits expressed in pounds per million Btus are not enforceable, and the permit fails to demonstrate continuous compliance over all operating conditions and fails to ensure protection of air quality. The United States District Court for the Eastern District of Kentucky and the U.S. EPA have recognized the need to include a heat input limit as an enforceable "operating limit." See United States v. East Kentucky Power Cooperative, slip op. at 20-25; U.S. EPA, Order Granting in Part and Denying in Part Petition for Objection to Permit, Aug. 30, 2007, at 12 (remanding permit for incorporation of a maximum heat input limit).

The requirement for setting a limit in terms of both an hourly and a production rate, while not explicit, arises from the express provisions that (a) BACT ensure the maximum degree of reduction achievable for each regulated NSR pollutant, (b) permits establish a method to ensure continuous compliance with all permit limits, i.e., ensure compliance with BACT limits over all operating conditions, (c) permit limits be enforceable, and (d) short-term ambient standards are protected. See 401 KAR 51:001, Sec. 1(25); 42 U.S.C. § 7602(k), Secs. 10 and 26; 401 KAR 51:017, Sec. 9. The

NSR Manual cited by Petitioners merely explains the interaction of these various requirements and how they direct the setting of a BACT limit; it does not purport to create a new requirement or unreasonably interpret the existing requirements. See NSR Manual at B.56.[34] As stated by U.S. EPA, "that the purpose of requiring dual limits is to ensure emissions are controlled regardless of the production rate or operational conditions of the facility." In re Steel Dynamics, Inc., 9 E.A.D. 165, *139 (EAB 2000).

Thus, the Hearing Officer's Report and Secretary's Order regarding Revision 2 and the need to set permit limits in both units of mass per time and mass per heat input are in error. The Hearing Officer erred in finding that the regulations do not compel setting limits in this manner. Hearing Officer's Report, June 13, 2007, at p. 212, As set forth above, dual limits are in fact required by federal and state regulations. The Secretary's reliance on the Hearing Officer's and Cabinet's position therefore is similarly in error. Secretary's Order at 2-3.

In addition, it is not clear why the Cabinet, in its exceptions to the Hearing Officer's Report on Revision 2, agreed to include an hourly rate for carbon monoxide but not for particulate matter and VOCs. The Cabinet agreed to include the CO hourly rate because the rate had been used for air quality modeling to demonstrate compliance with NAAQS. Exceptions at 3; see also Secretary's Order at 3, fnt 2, and 5 (CO permit limit for Unit 31 to include an hourly rate). According to the Cabinet, modeling was not required to demonstrate compliance with NAAQS for any other pollutant. Exceptions at 3-4. However, the Statement of Basis for Revision 2 clearly states that modeling was submitted to demonstrate compliance with the particulate matter NAAQS. Revision 2 SOB at 31-34. The U.S. EPA commented that hourly limits need to be set for both PM/PM10 and VOCs, as well as CO. Revision 2 Response to Comments at 6. The permit should include an hourly rate for particulate matter and VOCs.

Finally, our review of the Revision 3 draft permit showed only a CO limit expressed in lb/MMBtu, with no hourly limit as promised by the Cabinet and noted by the Secretary. See Revision 3 draft permit at 29, Cond. B.2(f). The Revision 3 draft permit should be revised to include an hourly rate for CO, particulate matterPM/PM10, and VOCs.

12. Division's response: *The Division does not concur. Permit V-02-043 R2, was amended after the issuance of the draft of V-02-043 R3, to include the changes required by the Secretary's Final Order issued on September 28, 2007 resolving a permit challenge brought by these commenters after the issuance of V-02-043 R2. The changes required by the Secretary's Order have now been incorporated into Revision 3. The issues raised in this comment were addressed and resolved by the September 28, 2007 Secretary's Order. The Secretary's Order was not appealed, is now final and the issues resolved therein are no longer subject to review.*

b. LG&E and KDAQ must fully consider clean fuels in the BACT analyses.

As clarified by the Thoroughbred decision, the Cabinet must consider clean fuels in its BACT analysis. See Thoroughbred slip op. at p. 8. The BACT analyses for SAM and PM continue to fail to consider use of clean fuels. As with the recent Thoroughbred and Spurlock permits, LG&E

[34] "BACT emission limits or conditions must be met on a continual basis at all levels of operation (e.g., limits written in pounds/MMbtu or percent reduction achieved), demonstrate protection of short term ambient standards (limits written in pounds/hour)." In addition, the Cabinet mischaracterizes the weight (not) to be given the NSR Manual. Cabinet's Memorandum at pp. 6-7. As Petitioners have laid out, a draft guidance is to be given deference in keeping with its power to persuade on the issue at hand. The NSR Manual here integrates various existing PSD requirements in a manner completely consistent with their text and purpose. Such integration is crucial to effecting the overall ……..

and KDAQ fail to provide an explanation as to "why KYDAQ did not consider selection of a lower sulfur coal 'appropriate or necessary' for achieving BACT at [TC2] based on the applicable permitting criteria."[35]

Similar to Spurlock, LG&E identified several different types of coal or coal blends for use as fuel and did not eliminate any of them as technically infeasible. In fact, LG&E openly states that the facility will be able to and will burn the range of fuels presented in the application. An analysis of the three blends described in the application, prepared for LG&E by a consultant, shows that Test Coal B (the lowest in sulfur content) in conjunction with a wet ESP will result in lower emissions of sulfuric acid mist than will the performance coal or Test Coal A . See LGE- 0021862, submitted in the Revision 2 proceeding. Despite this showing that the sulfur content of the coal is relevant to emission levels using the selected BACT add-on control, neither LG&E nor KDAQ provide the requisite analysis explaining why one coal type – Test Coal B – was not the basis for BACT. Instead, the BACT limits may be met by all three blends. The coal blends also differ in terms of ash content, and fuel sulfur level is related to formation of the condensable fraction of total PM (via formation of sulfur trioxide, which reacts with water in flue gas to form SAM), but the applicant and KDAQ fail to assess cleaner fuels for PM BACT. The permit cannot issue without these analyses. See Thoroughbred slip op. at p. 8 ("the Cabinet's failure to consider the use of lower-sulfur coal as a means of reducing SO2 emissions constitutes a breakdown of the BACT analysis and compels a remand to the Cabinet for consideration of cleaner fuels in its BACT analysis.").

BACT requires a pollutant-by-pollutant determination. Where, as here, a project nets out of SO2 BACT, the applicant is not absolved from considering clean fuels in its BACT determinations for other pollutants.[36] As this plant is not a mine-mouth plant, consideration of cleaner fuels is not "redefining the source," but is instead a control technology that must be considered as part of the BACT analysis. See Sierra Club v. U.S. EPA, 2007 U.S. App. Lexis 20215 at *7 (7th Cir. Aug. 24, 2007) ("Some adjustment in the design of the plant would be necessary in order to change the fuel source from high-sulfur to low-sulfur coal… but if it were no more than would be necessary whenever a plant switched from a dirtier to a cleaner fuel, the change would be the adoption of a 'control technology.' Otherwise 'clean fuels' would be read out of the definition of such technology.") LG&E must provide a proper top-down analysis explaining why Test Coal B does not set BACT for SAM and PM.

c. Revision 3 retains an unsupported BACT limit for SAM.

The permit does not set a proper BACT limit for SAM, as reinforced by the Thoroughbred decision. As pointed out by the court, BACT does not ask what other plants are currently achieving, but "what can this plant achieve for the future?" Thoroughbred slip op. at 8. The Cabinet and LG&E failed to conduct an analysis of what this plant can achieve, rendering the basis for the permit limits

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35 U.S. EPA, Order Granting in Part and Denying in Part Petition for Objection to Permit (response to Spurlock Title V permit submitted by Sierra Club), Aug. 30, 2007, at p. 30.

36 The historic consideration of low sulfur fuels primarily for SO2 BACT most likely is due to that pollutant's high correlation with fuel sulfur levels, not the irrelevance of clean fuels to other pollutants. If low sulfur fuel is not technically or economically feasible for SO2 control, it is highly likely to be technically or economically infeasible for other pollutants whose levels are impacted relatively less than SO2 by its use. In addition, where use of low sulfur fuel is selected through an SO2 BACT analysis, that selection will carry through as a baseline for BACT for SAM and PM (i.e., clean fuels will be part of BACT for other pollutants like SAM and PM whether explicitly stated or not). The AES Puerto Rico permit, for example, contains a limit on sulfur content of the fuel and a SAM BACT limit significantly lower than that at TC2. This permit was cited by U.S. EPA in its response to the Spurlock Title V petition with regards to SO2 BACT and low sulfur coal. Consideration of low sulfur coal in an SO2 BACT analysis therefore may be a proper proxy for low sulfur fuel in a SAM or PM analysis.

and the BACT analysis inadequate and improper.

Kentucky regulations define BACT as requiring the maximum degree of reduction of each regulated pollutant achievable through "production processes and available methods, systems, and techniques." 401 KAR 51:001 Sec. 1(25). In other words, a BACT limit must derive from the method of pollution control used. To determine whether the proposed BACT limit represents the maximum degree of reduction achievable, supporting information is required, including a detailed description of the system of continuous emissions reduction planned for the source or modification, emissions estimates," and other supporting information. 401 KAR 51:017 Sec 12(1)(c).

All permit limits must be technically accurate. 401 KAR 52:001 Sec. 1(31). Key to selecting a technically accurate BACT limit guaranteeing the maximum degree of reduction achievable is identifying "a corresponding performance level… for [the best control technology] considering source-specific factors." NSR Manual at B.23. Information to be considered in determining the performance level representing achievable limits are manufacturer's data, engineering estimates, and the experience of other sources. Id. at B.24. The basis for the proposed limits must be clearly documented in the application, including calculations related to the selected control equipment and estimated emissions. See 401 KAR 52:020 Sec. 5. Without this information, the agency cannot fulfill its duty to make a BACT determination and to provide the basis for its decision.

The Revision 2 application and SOB fail to demonstrate that the selected SAM limit represents the maximum degree of reduction achievable for this plant, in conflict with the above regulations and the Thoroughbred decision. The permit sets BACT for SAM as use of a WESP and an emission limit of 26.6 lb/hour. As support for this limit, the Rev 2 application lists two previous permits: the Thoroughbred permit with a limit of 0.00497 lb/MMBtu, and a permit with a different limit based on a different control technology. Then, the applicant simply concludes that the source-specific emission limit associated with a WESP at TC2 is 26.6 lb/hour. Rev 2 Appl., App. I, at I-29.

The application includes no supporting calculations for the SAM limit or cites to such calculations. Nor does the applicant discuss assumptions made in deriving the 26.6 lb/hour figure, other than that the "estimated sulfuric acid production rate basis is oxidation conversion of a total of 2.0 percent of SO2 in the combustion process and across the SCR catalyst." Rev 2 SOB at 21.The Cabinet concluded that the "proposed control technology and emission rate [of 26.6 lb/hour based on a rate of 0.004 lb/MMBtu] constitute BACT for the new SPC boiler." Id. at 22. This approach to setting BACT is inconsistent with the Thoroughbred decision, which points out that "The BACT analysis requires a thorough, case-by-case analysis, seeking out the 'maximum degree of reduction… achievable for the proposed source." Thoroughbred slip op at 8 (citing 401 KAR 51:017(1)(8)). Mere consideration of what other facilities are proposing or achieving is insufficient and a "more complete BACT analysis" is required. Id. at 8.

Here, the SAM BACT limit is apparently based on the Thoroughbred permit (which contained a limit expressed in lbs/MMBtu and not lbs/hour as in the TC2 permit, necessitating support for the conversion under the Cabinet's view that lbs/MMbtu and lbs/hour are two different limits), air quality modeling and the lowest measurable level of SAM, not the lowest emissions level achievable by this plant as required by the Thoroughbred decision. BACT for SAM should have been set as installation of a WESP designed to achieve the greatest control efficiency, an emissions limit associated with that control efficiency, and operation of the WESP at full capacity for all inlet concentrations. The SAM BACT limit also must take into consideration any reductions from use of hydrated lime. (See III.a)

d. Failure to include SSM in air quality modeling.

As reinforced by the Thoroughbred decision, slip. op. at 9, the applicant and the Cabinet

erred by failing to include periods of startup, shutdown and maintenance in their BACT analyses and determinations for PM/PM10, CO, VOCs, sulfuric acid mist, and fluorides. This failure also constitutes a failure to demonstrate that the proposed unit will not cause or contribute to a violation of a NAAQS or PSD increment, as (a) the emission rate used in the modeling is not required during periods of startup, shutdown and malfunction, and (b) the permit application did not include any estimates of emissions during startup, shutdown, and malfunction to be used in modeling. During startup, shutdown and malfunction, emissions of CO, VOCs and NOx, as well as other NSR pollutants, can increase due to incomplete combustion or because the pollution control technologies cannot be used.

Specifically, by omitting VOC emissions from startup, shutdown and malfunction, and failing to conduct a full ambient air quality impact analysis for ozone, the applicant failed to demonstrate protection of the ozone NAAQS and increment. Under Kentucky regulations, a facility that emits greater than 100 tpy of VOCs must conduct an ambient impact analysis due to concerns with violating ozone NAAQS and increments. 401 KAR 51:017 Sec. 7(5) and Secs. 9-11. The Revision 2 application estimated TC2's VOC emissions at 97.8 tpy; the Cabinet used this figure as the basis for an exemption from the ozone impacts analysis requirement. Rev. 2 Appl. Table 2-1 at 2-13, Rev. 2 SOB at 4, 31-34. Given a number this close to the 100 tpy threshold, any increase in VOCs – such as those from startup, shutdown and malfunction – can be significant in terms of triggering an ambient air quality analysis to assess compliance with ozone NAAQS and increments. Neither the applicant nor the agency determined whether startup, shutdown and malfunction could result in additional VOC emissions in the range of 2.2 tpy or more. The applicant thus failed to demonstrate protection of ozone NAAQS and PSD increments.

13. Division's response: *The Division does not concur. Subparagraphs (b) – (d) above do not address the modifications being made in Revision 3. The commenters reassert issues previously brought in their challenge of permit V-02-043 R2 which were addressed and resolved by the September 28, 2007 Secretary's Final Order (File No. DAQ-27602-042). The Secretary's Order was not appealed, is now final and the issues resolved therein are no longer subject to review.*

VI. Miscellaneous

a. SAM compliance.

Compliance with the SAM limit is to be determined using "EPA reference method 8." SOB at p. 19. Commenters note that U.S. EPA Method 8 has been shown to be insufficient in the coal plant setting, in that it underestimates emissions. A recent study entitled "Demonstrating Compliance with Sub-ppm Acid Mist Limits: Can EPA Method 8 Handle the Challenge?" confirms this inadequacy.[37] Other methods exist for accurately assessing compliance with the SAM limit, such as controlled condensation. See Attachment E. The permit should be modified to require compliance

[37] Scott Evans, Kelly Aita, and Eric Chi, Clean Air Engineering, Palatine IL. An abstract for the study states as follows: "EPA Method 8 for measuring SO2 and H2SO4/SO3 has been used for years in the utility industry, but was designed and validated for use at sulfuric acid plants. However, the method is increasingly being specified in operating permits to measure very low levels of SO3 at coal fired power plants and other sources. This paper looks into the capabilities of the method in a typical coal-fired boiler gas stream; focused on the method detection limit (MDL) for Method 8 and several areas where biases arise, especially at low levels of SO3. Areas that are addressed include: experimentally determined MDL, SO2 oxidation bias, titration error, analyst bias, and filter bias. A discussion is also included on potential procedures to improve the accuracy of the method at low SO3 concentrations."

testing using such a method or methods in place of Method 8.

14. Division's response: *The Division does not concur. This comment does not address the modifications being made in Revision 3. The commenters reassert issues previously brought in their challenge of permit V-02-043 R2 which were addressed and resolved by the September 28, 2007 Secretary's Final Order (File No. DAQ-27602-042). The Secretary's Order was not appealed, is now final and the issues resolved therein are no longer subject to review.*